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ONTARIO WATER
RESOURCES COMMISSION

ANNUAL REPORT

1962

TOWNSHIP OF WESTMINSTER

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WESTMINSTER TOWNSHIP SEWAGE TREATMENT PLANT

OPERATED FOR

THE TOWNSHIP OF WESTMINSTER

BY

THE ONTARIO WATER RESOURCES COMMISSION

Mr. A. M. Snider - Chairman

Dr. A. E. Berry - General Manager

Mr. D. S. Caverly - Assistant General Manager, and Director of Plant Operations

Mr. B. C. Palmer - Assistant Director, Division of Plant Operations

Mr. A. C. Beattie - Project Engineer, Division of Plant Operations

Mr. J. F. Ciavarella - Assistant Project Engineer, Division of Plant Operations

Prepared by the

Division of Plant Operations

PROJECT DEVELOPMENT

The Township of Westminster approached the Ontario Water Resources Commission in May of 1958 to undertake the financing and operation of a new sewage treatment plant and trunk sewer.

The plant was designed by S. E. Chipman and Company Limited of London and construction was carried out by the W. A. Haggerty Construction Company of Ingersoll, and Frid Construction Company Limited of Hamilton.

The cost of the trunk sewer was approximately $ 65,000.00 and the plant cost approximately $ 175,000.00 making a total cost for the project of about $ 240,000.00.

OPERATORS

The plant is operated 8 hours per day from Monday through Friday and is checked over for 2 hours on Saturdays and Sundays.

DESCRIPTION OF PLANT

General Description :

The Westminster Township Plant is an extended aeration or total oxidation type using diffused air. The 24 hour design flow is 250,000 gallons, which will treat the sewage from 5,000 persons at a flow of 50 gallons per capita per day.

Coarse Bar Screen

The sewage enters the influent chamber from a 21-inch diameter sewer. A coarse bar screen is located in the overflow. This unit has 17 bars 1½" x ½" at 1" centres to screen out large objects from the sewage.

Barminutor

The sewage which enters the plant passes through a Model - B - 12 Barminutor which cuts and shreds the solid material.

Flow Measurement

The Westminster Township Plant is not equipped with a flow meter but flow is calculated from the length of time the pumps run, and the capacities of the pumps.

The flow at the plant has been much below the design flow which makes the operation of the plant more difficult.

Aeration Tank

The aeration tank consists of 2 rectangular units each 54' x 27' x 14' with a total volume of 40,368 cubic feet which provides a detention period of 24.2 hours at a flow rate of 250,000 gallons per day, assuming no return.

Diffused air is supplied at 3.76 cubic feet per gallon by three blowers each rated at 337 cfm @ 7 psi.

Activated sludge is returned to the aeration section from the final tanks at the rate of 100 to 300% of the plant flow.

In the aeration tanks, oxygen and proper mixing are provided for the biological activity which is required for this type of sewage treatment.

Final Sedimentation Tanks

There are two rectangular final sedimentation tanks each 54' x 8' x 9' making a total volume of 48,500 gallons. The detention period of these tanks at the design flow of 250,000 gallons is 4.65 hours.

At design flow the surface settling rate is 290 gallons per square foot of tank per day, and the weir overflow rate is 1955 gallons per linear foot of trough per day.

Each tank is equipped with a Roto-line scum trough for the removal of grease and other floating material.

Pump Building

The building at the plant houses the combined office and laboratory, the chlorination room, a washroom and a pump room containing the pumps and the blowers.

The following pumps are located in the pump room :--

1. Three 100 GPM @ 23' TDH Chicago Pump Company non-clog centrifugal pumps. Two are equipped with 2 HP Lincoln electric motors. These units pump the raw sewage from the wet well to the aeration tanks. One pump is attached to a Wisconsin gasoline engine for emergency use during a power failure.

2. One 200 GPM @ 10.5' TDH Chicago Pump Company non-clog centrifugal pump equipped with a 2 HP U.S. vari-drive electric motor. This unit pumps the activated sludge from the final sedimentation tank to the aeration tank.

3. One 900 GPM @ 9.6' TDH Chicago Pump Company centrifugal pump equipped with a 2 HP Lincoln electric motor. This unit pumps the effluent from the chlorine contact chamber to the sand filters.

CHLORINATION

The chlorine is added in a rectangular chlorine contact chamber which has a volume of 10' x 7' x 9' = 630 cubic feet or 3930 gallons which gives a contact period of 22.7 minutes at the design flow of 250,000 gallons per day.

INTERMITTENT SAND FILTER

There are four rectangular sand filters each 160' x 42' for a total area of 26,900 square feet. These filters have a minimum depth of 30" of sand and the capacity of the filters combined is 450,000 gallons/acre/day.

The effluent from the chlorine contact chamber passes through the filters and is then discharged to Dingman Creek.

SLUDGE HOLDING TANK

A holding tank is provided with a volume of 4,460 cubic feet for emergency purposes only.

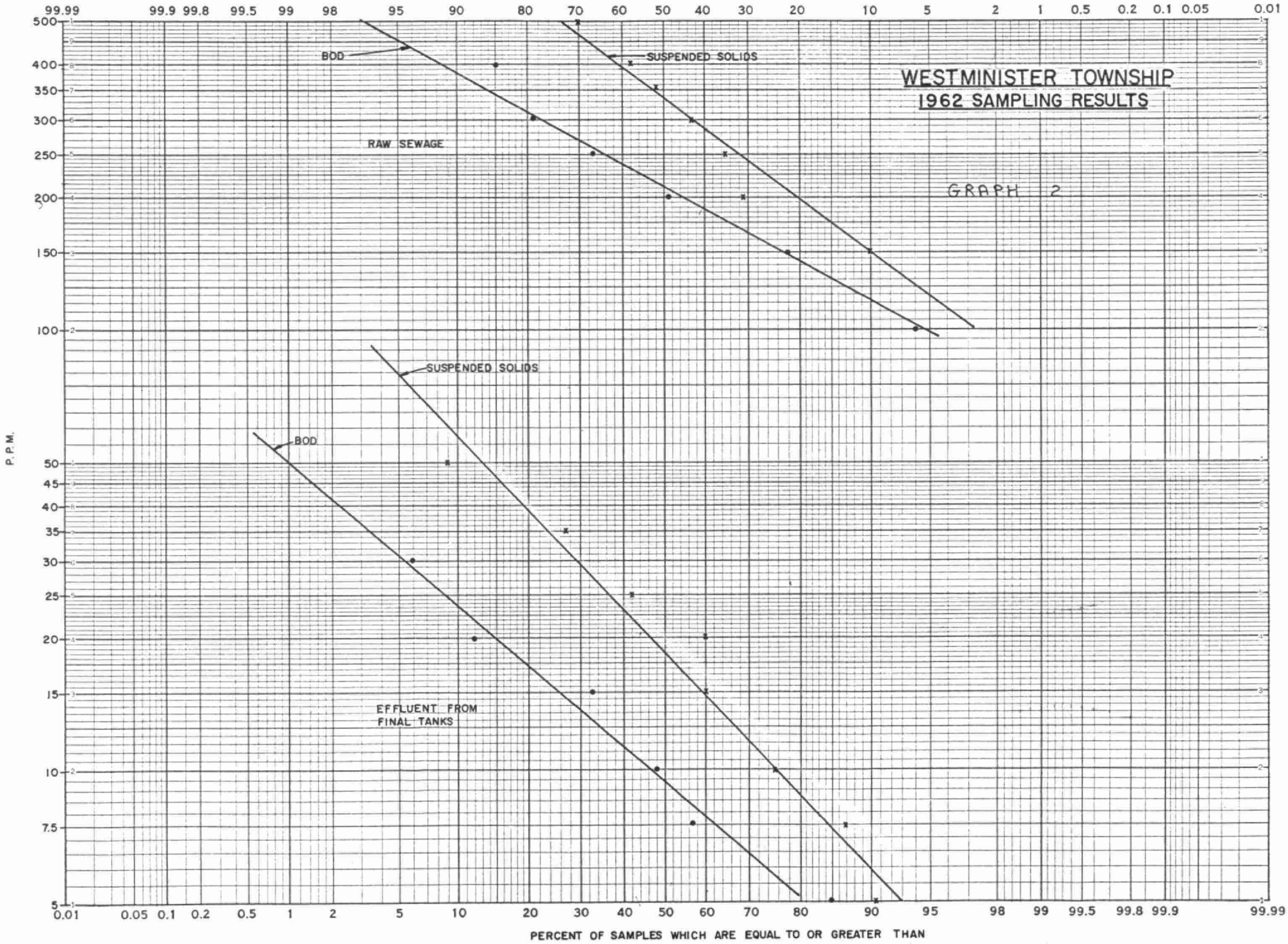
FLOW (1962)

MONTH	MAXIMUM	MINIMUM	TOTAL (M.G.)	DAILY AVERAGE (M.G.D.)
January	0.068	0.016	1.230	0.040
February	0.089	0.015	1.107	0.040
March	0.196	0.025	1.977	0.064
April	0.058	0.020	1.380	0.046
May	0.052	0.018	1.253	0.040
June	0.058	0.014	1.028	0.034
July	0.056	0.010	0.997	0.032
August	0.049	0.014	1.119	0.036
September	0.047	0.011	1.014	0.034
October	0.051	0.015	1.199	0.039
November	0.084	0.023	1.464	0.049
December	0.069	0.019	1.214	0.039
TOTAL:			14.982	
AVERAGE:			1.245	0.038

SAMPLING RESULTS

MONTH	B.O.D. REMOVAL			S.S. REMOVAL		
	RAW	TREATED	% REDUCTION	RAW	TREATED	% REDUCTION
January	125	11	91	136	40	71
	125	10	92	288	60	79
February	175	24	86	412	30	93
March	305	37	55	784	38	97
	165	47	72	828	40	95
	155	6	93	182	30	84
April	510	6	99	1102	20	98
	170	7	96	170	8	95
	245	6	98	234	22	91
	110	15	87	194	32	84
May	190	12	94	600	22	97
	400	18	96	706	28	96
	230	2	99	492	2	99
	280	7	98	732	24	97
June	185	7	96	310	220	36
	144	4	97	182	9	95
	325	10	97	328	3	99
July	220	4	98	346	3	99
	90	4	96	125	5	96
	275	13	95	492	12	98
August	260	10	96	396	38	90
	210	8	96	506	44	91
	235	15	94	168	32	81
	260	18	93	400	74	82

MONTH	B.O.D. REMOVAL			S. S. REMOVAL		
	RAW	TREATED	% REDUCTION	RAW	TREATED	% REDUCTION
September	125	9	93	278	22	92
	190	5	98	276	48	83
	95	20	79	1002	10	99
October	600	18	97	686	20	97
	150	18	88	153	12	92
	200	16	92	132	14	89
November	460	6	99	1296	9	99
	430	6	99	360	11	97
December	175	2	98.5	159	8	95


WESTMINISTER TOWNSHIP
1962 SAMPLING RESULTS

GRAPH 2

FLOW

During 1962 a total of 15 million gallons of sewage were treated at a total cost of $ 9,454.68. The average daily flow was 38,000 gallons per day which is 15 per cent of the design capacity of the plant.

From Graph # 1 it can be seen that the flow has decreased somewhat from 1961 and has evened out to a greater extent. It can be seen that 90 per cent of the time the flow exceeds 29,000 gallons per day and 10 per cent of the time it exceeds 54,000 gallons per day.

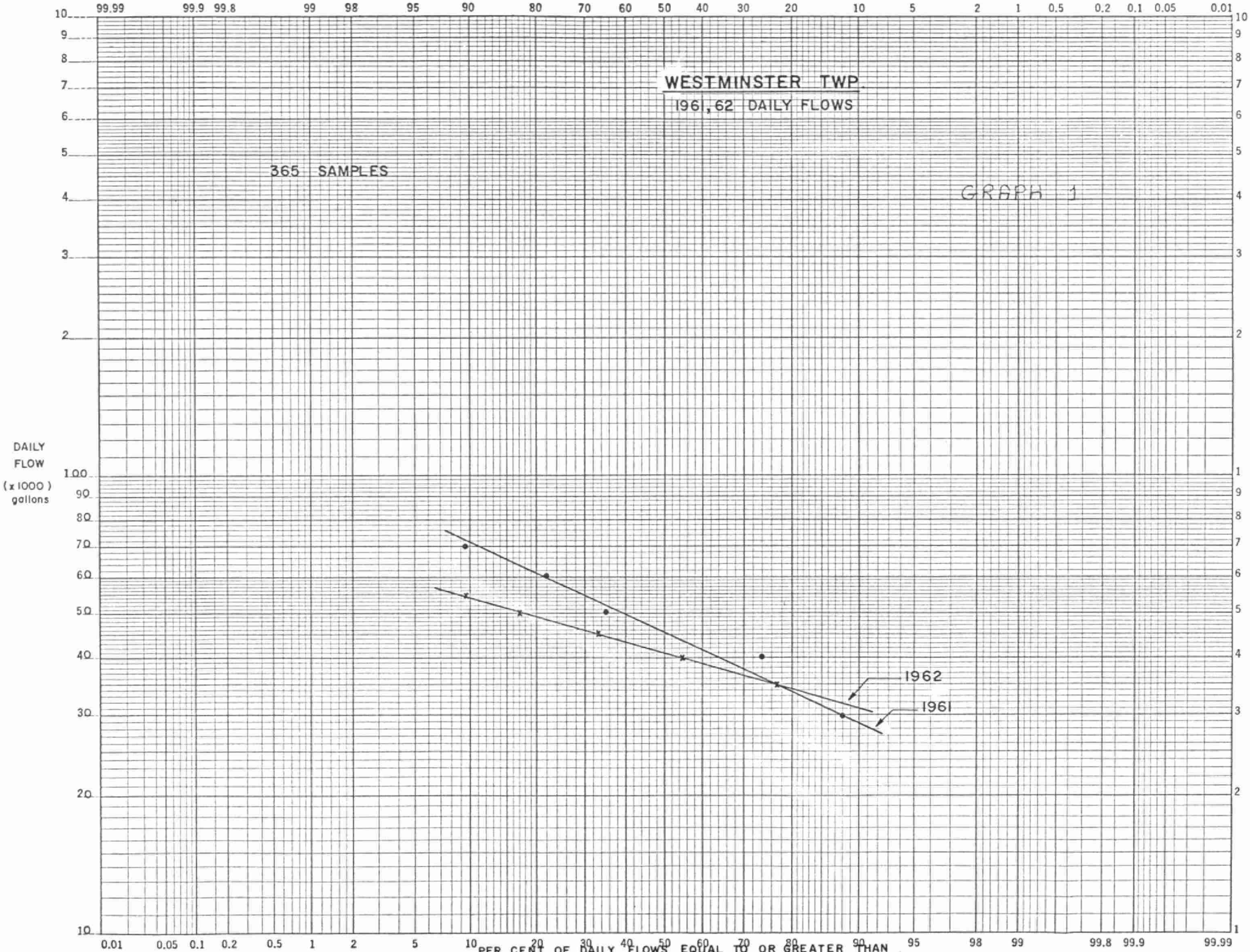
RAW SEWAGE

Graph # 2 indicates the results of the raw sewage sampling. The average BOD was 220 ppm. It is seen that 90 per cent of the time the BOD exceeded 130 ppm and 10 per cent of the time it exceeded 380 ppm.

The average S.S. in the raw sewage was 340 ppm. It can be seen that 90% of the time the S.S. was greater than 150 ppm and 10% of the time it exceeded approximately 600 ppm.

The final effluent had an average BOD of 9.5 for a BOD reduction of 95% and the reduction of suspended solids was from 340 to 18.5 or 94%.

It should be noted that these results are for the final clarifier effluent and during the summer, this undergoes further treatment by passing through the sand filter beds before being discharged to the creek.


WESTMINSTER TWP.
1961, 62 DAILY FLOWS
365 SAMPLES
GRAPH 1
DAILY FLOW (x 1000) gallons
10
9
8
7
6
5
4
3
2
100
90
80
70
60
50
40
30
20
10
99.99
99.9
99.8
99
98
95
90
80
70
60
50
40
30
20
10
5
2
1
0.5
0.2
0.1
0.05
0.01
1962
1961
0.01
0.05
0.1
0.2
0.5
1
2
5
10
20
30
40
50
60
70
80
90
95
98
99
99.8
99.9
99.99
PER CENT OF DAILY FLOWS EQUAL TO OR GREATER THAN

WESTMINSTER S.T.P.

POWER

MONTH	KWH USED	MISC. & SERVICE CHARGE	GROSS	NET
January	22,900	58.05	239.83	215.85
February	13,800	56.70	205.98	185.38
March	14,000	56.70	206.64	185.98
April	7,300	58.05	188.35	169.51
May	8,400	45.90	157.60	141.84
June	9,500	45.90	161.23	145.11
July	7,900	45.90	155.95	140.35
August	10,100	45.90	163.21	146.89
September	8,900	45.90	159.25	143.32
October	8,800	45.90	158.92	143.03
November	11,900	45.90	169.15	152.23
December	20,000	58.05	230.26	207.23
TOTAL:	143,500	608.85	2,196.37	1,976.72
AVERAGE:	11,958	50.74	183.03	164.73

CHLORINE

	AVERAGE DAILY FLOW (GALLONS)	AVERAGE CHLORINE USED (POUNDS)	AVERAGE CHLORINE DOSAGES (PPM)
May			
1 - 5	46,600	5.4	11.6
6 -12	45,000	4.4	9.8
13-19	42,100	4.5	10.7
20-26	33,000	5.4	16.3
27-31	35,800	7.0	19.6
June			
1 - 9	36,200	---	----
10-16	34,500	4.5	13.1
17-23	32,800	5.0	15.2
24-30	32,900	5.0	15.2
July			
1 - 7	34,000	5.0	14.7
8 -14	32,400	5.0	15.4
15-21	20,700	3.0	14.5
22-28	39,400	3.0	7.6
August			
1 - 4	38,000	5.0	13.2
5 -11	37,000	5.0	13.5
12-18	36,300	5.0	13.8
11-25	32,500	5.0	15.4
26-31	37,700	5.0	13.3
September			
1 - 8	31,500	5.0	15.9

Cont'd ......

	AVERAGE DAILY FLOW (GALLONS)	AVERAGE CHLORINE USED (POUNDS)	AVERAGE CHLORINE DOSAGES (PPM)
9 -15	33,300	5.0	15.0
16-22	36,200	5.0	13.8
23-30	37,100	5.0	13.5
October			
1 - 6	39,000	5.0	12.8
7 -13	34,600	5.0	14.5
14-16	34,000	4.0	11.8

PROJECT OPERATION STATEMENT

1962

MONTH	EXPENDITURE	PAYROLL	CASUAL PAYROLL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	SUNDRY
JAN.	519.96	338.44	-----	181.52	------	-------	------	-------	------
FEB.	704.08	338.44	-----	215.85	------	11.54	------	83.41	54.84
MAR.	850.89	338.44	85.72	185.38	------	85.78	------	-------	155.57
APR.	632.09	338.44	-----	185.98	------	53.67	------	-------	53.96
MAY	626.82	338.44	44.50	------	2.15	44.20	152.97	-------	44.56
JUNE	774.22	338.44	-----	311.35	------	15.03	------	9.93	99.47
JULY	824.24	335.82	-----	145.11	239.00	56.87	------	-------	47.44
AUG.	735.08	495.30	63.58	140.35	------	9.11	------	-------	26.74
SEPT.	949.53	345.72	101.80	146.89	------	31.43	------	-------	323.69
OCT.	639.82	330.20	57.24	143.32	------	85.52	------	-------	23.54
NOV.	607.32	330.20	------	143.03	------	-----	------	-------	134.09
DEC.	1590.67	646.56	-------	152.23	(56.69)	85.14	486.61	-------	276.82
TOTAL:	9454.68	4514.44	352.84	1951.01	184.46	478.29	639.58	93.94	1240.72

INSPECTIONS

In 1962 the water pollution control plant at Westminster Township was visited for the purpose of inspection on 10 occasions by Project Engineers from the Division of Plant Operations of the OWRC. In addition, the Electronics Section made 3 trouble calls and the Maintenance Section made two trouble calls and one inspection trip which is taken annually to check thoroughly every piece of equipment in the plant. The work done in the plant included :- the installation of new bearings in blower # 1; correcting the timing gear; dismantling the sludge return pump, replacing the shaft sleeve; adjusting the impeller and then installing and testing the pump.

GENERAL

In 1962 the plant functioned efficiently and had no serious problems. January found the # 1 air blower out of service due to damaged bearings and end seals, but within one week, replacement parts were obtained and the blower was repaired and placed back in operation. On Wednesday, December 9th, Don Simpson replaced his brother Earl as the operator of the plant. Due to an excess of sludge in the storage chamber, sludge was hauled from the plant in the fall of the year.

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